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PLICATION AND TUCKING OF THE CECUM*

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In the course of abdominal operations, especially for appendicular involvement or disease of the pelvic organs in women we frequently encounter a greatly dilated and elongated cecum often prolapsed to such an extent as to occupy the pelvic cavity.

That such a condition is abnormal is evident. What effect it may have upon producing or aggravating the symptoms for which we attempt operative relief is not so plain. Further, what benefit may result from the attempt to restore the bowel to its normal size and position is not definitely agreed upon. With the object of considering this aspect of intraabdominal technic I offer a brief summary of a few cases in which I have attempted to repair this condition as part of the work attending operative treatment in the lower abdomen.

The *causes* of this abnormal dilatation and elongation of the cecum and, to a less extent, of the lower portion of the ascending colon are probably several. I believe that the inhibition of normal peristalsis due to a mild but persistent state of inflammation of the appendix (and, in women of the tubes) is responsible in the main for this condition. The cecal reservoir is constantly overloaded by feces and distended by gas. Acting over a long period of time this leads to an abnormal dilatation and elongation of this portion of the intestine. A serious secondary condition attends this state. This is the formation, seepage and absorption of toxins resulting from increased bacterial activity in the presence of putrefying intestinal contents. The local reaction of this process is expressed by the formation of adventitious bands and membranes which may reach from the appendix to the hepatic flexure and even to involve the gallbladder and pylorus.

Possibly some of these bands and membranes of new formation may be Nature's reaction to the greater weight which the cecum and lower ascending colon are called on to sustain, and may cause no interference with bowel function. But more often Nature does not so nicely discriminate in her efforts and real pathological damage is caused, as in those cases where the reinforcement of the costocolic ligament at the hepatic flexure is in the nature of a narrow band which tightly constricts this portion of the gut and creates a vicious circle by adding to this naturally acute-angled gut a definite constriction which interferes with the emptying of the cecum. Further, we frequently find that this membranous formation does not stop at the ascending colon and hepatic flexure but passes over to the beginning of the transverse colon, binds this segment to the upper portion of the ascending colon and creates the so-called "double barreled" condition of the intestine.

All grades of adhesions, bands and membranes of varying thickness and surface area are found. Those that do not constrict the bowel are probably symptomless. I believe that general enteroptosis favors the development of a prolapsed and dilated cecum, but that it alone can produce adhesions and membranes without infection also being present is doubtful.

Chronic inflammation of the pelvic viscera in women causing intestinal stasis may also lead to dilatation and dropping of the cecum without the appendix being the chief offending member.

The *symptoms* that attend this condition are usually so masked by the symptoms of the chief organic lesion that leads to operation that no definite diagnostic points can be presented. However, in these patients who give a history of long standing, chiefly marked by a state of poor health, indigestion, gas, constipation with irregular attacks of pain and tenderness in the lower right quadrant, with a drag in the right flank, and in whom one finds, besides other local symptoms, a gaseous distention of the cecum, one may expect to see at the operation an abnormally dilated and prolapsed cecum,—but one usually rests content with the diagnosis of chronic appendicitis, in addition to whatever else may be detected.

The *method* I have used *for correcting this condition* has been a very simple one. It is not used in the presence of acute infections of the appendix or pelvic organs but is utilized only when time and case seem favorable. The membranes that do not constrict the gut are not meddled with, but any bands or veils that distinctly constrict the gut are severed. As a rule such bands are ligated at their origin from the parietal wall and then divided. The portion attached to the intestine usually needs no further attention. A few small bleeding points may have

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to be ligated individually. This plan permits the constricted gut to expand. Then the dilated and elongated cecum is narrowed and shortened by suturing the inner and the anterior bands together with a continuous linen stitch. This is carried up onto the ascending colon as high as seems necessary being careful to narrow the plait in the intestine so that no abrupt bulging or pocket is left. The continuous

Number	Sex Age M.,S.,W.	Preoperative diagnosis.	Chief symptoms	Pathological findings	Date of operation and procedure	Result—Remarks
1.	Male 30 Married	Chronic appendicitis with adhesions	Several attacks of appendicitis in year previous. Gastro-intestinal disturbance.	Band from omentum, 1½ inches wide crossing the upper part of the ascending colon, constricting it and producing dilatation of cecum. Chronically inflamed appendix from which a colonic veil passed upward over the cecum and ascending colon.	Nov. 7, 1916. Appendicectomy. Division of adventitious membrane and bands. Plication and tucking of cecum.	Reported in 1920 "Perfectly well".
2.	Male 28 Single	Chronic appendicitis. Reflex pyloric spasm.	Right side pain and tenderness, intestinal colics for past 3 years. Reflex gastric symptoms simulating ulcer syndrome.	Extensive colonic membrane extending upward to form a hand crossing the hepatic flexure and pylorus. Appendix acutely kinked by a band and chronically inflamed.	Dec. 20, 1916. Appendicectomy. Bands divided. Cecum and ascending colon plicated and tucked.	June, 1922, "Perfectly well".
3.	Female 30 Married	Left chronic pus tube.	For 2 years has had pain in both lower quadrants, scanty and painful menstruation. Losing weight and strength. Mass size of lemon in right cul-de-sac.	Patient had been operated upon in 1915 at another hospital for right pus tube, appendicitis and ventro-fixation of uterus. Extensive pelvic adhesions. Dermoid of right ovary. Left ovary cystic. Uterus ventro-fixed. Cecum dilated and prolapsed.	March 21, 1917. Supravaginal hysterectomy with excision of both tubes and ovaries. Cecum plicated and tucked.	One year later, gained 8 pounds. Only complaint—"hot flashes".
4.	Female 41 Married	Fibroid of uterus. Chronic appendicitis with adhesions.	For over 20 years has had pain in R. L. Q., constipation, indigestion, losing weight. Fibroid uterus about 3 inches in diameter.	Multiple fibroids of uterus. Large right cystic ovary. Smaller left cystic ovary. Atrophied appendix. Cecum distended and prolapsed. Kink in sigmoid from adhesion to left broad ligament.	April 21, 1917. Supravaginal hysterectomy with removal of both tubes and ovaries. Appendicectomy. Cecum plicated and tucked. Sigmoid freed and raw area peritonealized. (Referred to family physician for treatment.)	Six months later reported—"hot flashes". Mucous colitis, indigestion. Has suppurating molar tooth. Nothing on physical examination.
5.	Female 31 Married	Right cystic ovary. Acute anteflexion of infantile uterus.	Painful menstruation of several years duration.	Both tubes and ovaries normal. Pedicled fibroid as large as a hen's egg from fundus of uterus Appendix long, injected and with dilated cecum lying in cul-de-sac.	May 22, 1917. Curettage. Dudley operation on cervix. Fibroid removed. Appendicectomy. Cecum plicated and tucked.	Prompt recovery, no complications.
6.	Female 30 Married	Retroverted uterus. Cystic ovaries. Chronic appendicitis. Adhesions.	Menorrhagia, pain in R. L. Q. for 3 years. Previous attack of appendicitis 5 months ago.	Chronically inflamed appendix containing concretion. Adhesions. Dilated mobile cecum. Pelvis and rest of abdomen negative.	Sept. 27, 1917. Appendicectomy. Colonic adhesions severed. Cecum plicated and tucked.	Uneventful recovery. Never reported for observation.
7.	Female 36 Widow	Chronic appendicitis.	For past 15 years has averaged about one attack a year of appendicitis. Usual duration of attacks 2 weeks.	Chronically inflamed appendix. Distended and prolapsed cecum.	Oct. 12, 1917. Appendicectomy. Plication and tucking of cecum.	Reported 3 months later. Gained 8 pounds—perfectly well.
8.	Female 32 Married	Hypertrophied cervix. Acute anteflexion of uterus. Right cystic ovary. Chronic appendicitis.	For 4 years has had painful menstruation, every 21 days. Severe pain in R. L. Q. Marked gastro-intestinal disturbance.	Hypertrophied, cystic cervix. Both ovaries completely cystic, no normal tissue left. Very marked varicosity of pelvic veins. Uterus enlarged and boggy. Cecum dilated. Appendix normal.	Dec. 4, 1917. Circular amputation of cervix. Both tubes and ovaries excised. Appendicectomy. Cecum plicated and tucked.	Two years later reported "Everything all right."
9.	Female 29 Married	Marked cystic degeneration and hypertrophy of cervix. Cystic ovaries.	Profuse leucorrhea. "Blood poisoning" 8 years ago from miscarriage. Constipation.	Marked cystic degeneration of cervix. Both ovaries enlarged and cystic, covered by thin membranous adhesions. Immensely dilated and mobile cecum.	Nov. 19, 1917. Circular amputation of cervix. Conservative resection of ovaries. Appendicectomy. Cecum plicated and tucked.	July, 1918. Right ovary has enlarged. Uterus enlarged and tender. Did not report for further treatment or examination.
10.	Female 33 Married	Lacerated perineum and cervix. Retroversion of uterus. Chronic appendicitis.	For several years has had backache. Bladder and rectum symptoms. "Insides dropping down." Profuse leucorrhea.	Perineum torn to anal margin. Deep transverse laceration of cervix. Uterus congested, swollen, retrodisplaced. Cecum distended and prolapsed. Appendix chronically inflamed.	Feb. 26, 1918. Circular amputation of cervix. Flap-splitting perineorrhaphy. Simpson's shortening of round ligaments. Appendicectomy. Plication and tucking of cecum.	In good health until fall of 1921 when an examination showed a fibroid uterus 4 inches in diameter. Radium, not reported since.
11.	Female 40 Married	Abdominal adhesions. Carcinoma of bowel suspected.	Constipated all her life. Growing worse during past few months culminating 6 weeks ago in stoppage of bowels lasting 3 days, finally relieved by enemas and cathartics.	Sigmoid adherent along the left iliac fossa. Appendix retrocecal and kinked. Cecum dilated.	April 4, 1918. Sigmoid released. Appendicectomy. Cecum plicated and tucked.	June, 1918. Bowels operate with mineral oil. Some pain over cecum and colon. Did not report again.

12.	Female 15 Single	Chronic appendicitis.	Pain and cramps in R. L. Q. for past 3 years. Reflex gastric symptoms.	Uterus and ovaries infantile, uterus about size of one's thumb and the ovaries the size of almond nuts, yet the girl is well developed and weighs 120 lbs. Cecum dilated and prolapsed into pelvis. Appendix long and retroperitoneal. Colonic veils but not pathological.	Nov. 3, 1919. Appendicectomy. Cecum plicated and tucked. (Put on ovarian tablets without apparent benefit).	Dec. 4, 1923. Has been married about 2 years. Has a fine baby and is in good health.
13.	Female 18 Single	Chronic appendicitis with reflex spasm of the pylorus.	Indigestion, vomiting, gas, sour eructations for one year. Menses very painful.	Extensive colonic veils. Thickened, stiffened appendix. Dilated mobile cecum. Right cystic ovary size of hen's egg.	Sept. 16, 1918. Appendicectomy. Cecum plicated and tucked. Ovary resected.	Reported 3 months later—"all right." Not seen since.
14.	Female 34 Widow	Retroverted adherent uterus, adhesions in R. L. Q. Appendicectomy 2 years previously in another hospital.	Painful menstruation. Pain and tenderness in R. L. Q. Gastro-intestinal disturbance past 10 years.	Uterus contains two small fibroids, retroverted. Tubes and ovaries imbedded in extensive adhesions, both tubes seat of chronic inflammation and both ovaries cystic. Cecum dilated and prolapsed. Separate strings of fibrous material, also colonic membrane from cecum and ascending colon to mesentery, puckering gut.	March 25, 1919. Hysterectomy at isthmus, both tubes and ovaries excised. Bands and veils divided. Cecum plicated and tucked. Feb. 28, 1920. Adhesions across pylorus divided.	1922. Relieved of gastro-intestinal symptoms but operated for slipping lumbar vertebra with good result.
15.	Female 22 Single	Retroverted uterus, right cystic ovary prolapsed into cul-de-sac, chronic appendicitis. Prolapsed and dilated cecum.	Gastric symptoms 3-4 years marked by severe attacks of vomiting. Very painful menstruation. Severe anemia.	Right ovary size of hen's egg. One cyst in left ovary. Uterus small, completely retroflexed. Cecum dilated, prolapsed into pelvis.	Oct. 7, 1919. Conservative excision right ovary, cyst in left ovary punctured. Crossen's shortening of round ligaments. Appendicectomy. Plication and tucking of cecum.	June, 1920—"Doing very well". Taking endocrine substance.
16.	Female 26 Married	Chronic appendicitis with exacerbation.	Several years — headaches, gastric symptoms, marked constipation, attacks of pain in R. L. Q.	Appendix 4 inches long. Distal half much thickened and clubbed—area of active inflammation at centre. Cecum much dilated and elongated. No adhesions. Pelvic organs normal.	Dec. 30, 1919. Appendicectomy. Cecum plicated and tucked.	1922—Gained 33 lbs. Bowels regular. Been very well.
17.	Female 28	Chronic appendicitis, kinked. Reflex pyloric spasm.	For 15 years has had attacks of pain in R. L. Q. with vomiting. Sick from a few days to 3 months. Gastric symptoms of indigestion, gas, sour eructations, losing weight.	Cecum much dilated, prolapsed into pelvis. Appendix thick, hard. Adhesions from it covering cecum.	Feb. 9, 1920. Appendicectomy. Cecum plicated and tucked.	1924—Overworked—severe backache from retroverted fibroid uterus. Month later had gained 5 lbs. Appetite fine and no digestive trouble. Not reported since.
18.	Female 33 Married	Chronic appendicitis with pyloric spasm.	Symptoms similar to those of gastric ulcer for past 3-4 years.	Cecum dilated and prolapsed. Appendix acutely inflamed. Rest of abdomen normal.	June 1, 1920. Appendicectomy. Cecum plicated and tucked.	Uninterrupted recovery but never reported for observation.
19.	Female 32 Single	Chronic appendicitis with pyloric spasm.	Pain in both lower quadrants but of longer duration in right. Growing worse. Increasing constipation. Losing weight. Symptoms more acute for past 6 months.	Infantile uterus and ovaries. Appendix strictured 8 inches from end which is dilated and chronically inflamed. Cecum ballooned and prolapsed.	June 10, 1920. Appendicectomy. Plication and tucking of cecum.	Jan. 1921. No gastro-intestinal symptoms. Has gained weight.
20.	Female 27 Married	Chronic appendicitis. Cystic right ovary.	Diarrhea for 4-5 years. Pain in lower abdomen. Pain and tenderness in R. L. Q. Lost 12 lbs. in 5 weeks.	Cecum long and lying in pelvis. Appendix chronically inflamed. Band constricting the hepatic flexure. What was thought to be a prolapsed cystic right ovary was the prolapsed cecum, which lay in the cul-de-sac.	Sept. 28, 1920. Appendicectomy. Cecum plicated and tucked. Bands constricting hepatic flexure divided.	Uninterrupted recovery. Not seen since.
21.	Female 25 Married	Chronic appendicitis. Retrodisplaced uterus.	Painful menstruation. Constipation, colics, gas. Pain and tenderness in R. L. Q. Both kidneys prolapsed for one year.	Retrodisplaced uterus with acute anteflexion. Left ovary has multiple cysts. Appendix long and adherent. Cecum dilated and prolapsed into pelvis.	Dec. 7, 1920. Curettage. Appendicectomy. Seven-eights of left ovary excised. Crossen's shortening of round ligaments. Plication and tucking of cecum. (To wear corset for enteroptosis).	May 1921. Uterus in normal position. No symptoms.
22.	Female	Chronic appendicitis.	Pain and soreness in R. L. Q. Attack of appendicitis 1½ years ago. Menses scanty and painful.	Uterus acutely retroflexed. Appendix congested, swollen, stiffened. Cecum dilated, prolapsed and covered with colonic veils.	Feb. 8, 1921. Appendicectomy. Cecum plicated and tucked. Colonic bands severed. Ohlshausen's suspension of uterus. (To wear corset for enteroptosis).	Dec. 1923. Says she is perfectly well. Has gained much in weight.
23.	Female	Chronic appendicitis.	Constant gastric symptoms — gas, constipation, colics. Symptoms for several years but more acute in last six months.	Infantile pelvic organs. Cecum dilated and prolapsed into pelvis. Appendix retrocecal, kinked.	Jan. 5, 1922. Appendicectomy. Cecum plicated and tucked.	June, 1922. Feels "fine". Gaining weight.

suture accomplishes the shortening or tucking at the same time that the intestine is narrowed.

As stated at first, I am not dogmatic in thinking that plastic work accomplishes a cure of the patient independently of whatever other operative procedure is demanded by the pathology of the case, but I think, from my limited experience, it really aids in the desirable result.

Having operated upon a patient with this as a part of the pathologic condition one must not think his efforts are over when the abdomen is closed. The after-treatment is most important and comprises attention to diet, digestion, exercise, mild laxatives, supporting belts or corsets in enteroptotic cases and many such minor details that assist in curing the patient.

In submitting a tabulation of my cases it may be helpful to point out a few features:—

1. As to sex. There were only 2 males and 20 females. Of these 22 patients 13 were married, 7 single, and 2 widowed.

2. The youngest patient was 15 and the oldest 41. Sixteen were between 25 and 35.

3. Chronic appendicitis was diagnosed as the chief lesion present in 12 patients before operation. In 11 the diagnosis was confirmed at operation and one had developed an acute condition of the appendix in the interval between my examination and operation.

4. The following cases revealed at operation conditions not suspected or in addition to the lesions diagnosed before operation.

Case 3.—Diagnosed as left pus tube.	Had a dermoid cyst of the right ovary with a cystitic left ovary.
This patient had been operated upon two years before at another hospital for right pus tube.	
Case 5.—Pre-operative diagnosis, right cystic ovary and acute anteflexion of an infantile uterus.	Had normal pelvic organs with a small pedicled fibroid in the cul-de-sac.
Case 6.—Diagnosed as having adhesions, chronic appendicitis and retroverted uterus with cystic ovaries.	Had the two first conditions but normal pelvic organs.
Case 11.—Diagnosed as having adhesions with a possible carcinoma of the bowel.	Had extensive adhesions of sigmoid in the left iliac fossa, causing the increasing constipation.
Case 13.—Considered to have merely a chronic appendicitis with reflex pyloric spasm.	Had in addition to the appendicitis a right cystic ovary. As the patient was single and young no previous vaginal examination had been made.
Case 19.—Diagnosed as chronic appendicitis and cystitic right ovary.	Had the former but what was taken for a cystic ovary was the dilated cecum lying in the cul-de-sac.
Case 21.—Diagnosed as chronic appendicitis.	In addition to the pre-operative diagnosis there was found an acutely retroflexed uterus. Patient single and unwilling for a pelvic digital examination.

The results of the operations were uninterrupted convalescence in all cases. Thirteen reported at varying times from three months to six years as being cured. Five never reported after leaving the hospital. Four reported at intervals as cured of the condition for which operation had been done but with new developments. One had a suppurating molar tooth and mucous colitis. Another showed some enlargement of an ovary that had been conservatively resected for a cystic condition. A third developed a fibroid uterus three years after operation, and a fourth had slipping of the lumbar vertebra for which operation was performed at an orthopedic hospital with good results.

THE DIFFERENTIAL DIAGNOSIS OF ADENOMATA FROM COLLOID GOITER

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A review of the cases of adenomata and colloid goiter admitted to the goiter clinic of the New York Post-Graduate Medical School and Hospital* reveals a lack of conception of the clinical picture and the pathological process involved in the two conditions. The two diseases present a definite clinical and pathological picture which should be understood before any form of therapy is administered.

ADENOMATA: 1. Adenoma with normal secretory activity. 2. Adenoma with increased secretory activity, or hyperthyroidism.

In the first group we had fourteen cases. The average age of these patients was 26.6 years. The oldest was 44 and the youngest 12 years of age. This condition is usually met with in women between the twentieth and thirtieth years of age. This is the child-bearing period, when excessive demand is thrown upon the thyroid gland. There are four periods in which excessive demand is thrown upon the thyroid gland (Marine):

1. Intrauterine development
2. The period of adolescence
3. The child-bearing period
4. The menopause

It is during the third and fourth periods that fetal adenomata show rapid growth. The clinical picture is as follows:

1. The patient seeks medical advice for an enlargement of the thyroid gland, which is asymmetrical and is causing pressure symptoms; or the patient wishes advice for cosmetic reasons. These enlargements are usually confined to one of the lateral lobes of the thyroid, but the isthmus is quite often involved. On palpation, the consistency of the enlargement is much firmer than the surrounding

*From Dr. Charles Gordon Heyd's service.

thyroid substance unless there has been a hemorrhage into the adenoma, and then it may be soft and fluctuating. Occasionally smaller adenomata can be felt in other portions of the thyroid gland. The gland does not give a pulsation or bruit. The eyes are negative for exophthalmos as well as other signs of Graves' disease. The pulse is normal and there is no evidence of tremor. This picture may be from several months to several years duration.

2. Adenoma with increased secretory activity or hyperthyroidism. This group included twenty-three patients. The average age was 35.5 years. The youngest was 25 and the oldest 50 years of age. The average basal metabolism was +40.3. The lowest was +19, and the highest was +80. The clinical picture of these cases is the same as that of the first group, but the patients will state that for one to two years they had noticed shortness of breath on exertion, palpitation of the heart, or nervousness. They seek medical advice either for heart trouble or nervousness, but do not associate either with the presence of the goiter, which they have had for a number of years. The blood pressure is usually increased, due to the cardio-nephritic changes.

Pathology. 1. Adenoma with normal secretory activity gives a different pathological picture from that with increased secretory activity. The adenoma arise from the fetal adenomata which have remained dormant since intrauterine life. During the periods of life when excessive demand is thrown upon the thyroid gland, the fetal adenomata take on a cell growth to meet the demands of the body. These fetal rests are independent of the normal acini of the thyroid gland and are found in the interstitial tissue (Goetch). During the process of enlargement of the fetal adenomata they cause pressure atrophy of the surrounding tissue, which gives a definite capsule to the growth. Wilson (*Am. Jour. Med. Sc.*, May, 1923, p. 738) has demonstrated the difference in the microscopic pictures of adenomata with normal and with increased secretory activity. In the former, the cells are flattened and the colloid material takes a very deep stain. In the latter, the cells show definite increased activity with hypertrophy and hyperplasia of the parenchymatous cells, with the colloid material diminished and giving a much weaker staining reaction. Other sections of the gland in each condition will give a picture of normal thyroid tissue. This is not so in Graves' disease.

Laboratory Data. The basal metabolism is the only laboratory test that is of any aid in this condition. In adenomata with normal secretory activity, the metabolism is always within normal limits, but the test is of value in rendering a prognosis. All cases with a normal metabolic rate should have the test repeated yearly, and in this way an early hyperthyroidism is detected. In the cases of increased secretory activity, the metabolic rate may be much higher, with fewer clinical symptoms than in cases of Graves' disease. It is not uncommon to see a patient with adenoma with a plus 75 or 80 metabolism going about his daily routine; whereas in cases of Graves' disease a similar metabolism usually confines the patient to bed. This would tend to show that in adenomata there is chiefly an overfunction; whereas in Graves' disease there is an overfunction with a dysfunction.

Prognosis. Most cases of adenoma, either during repeated pregnancies or during the menopause, show signs of hyperthyroidism. For this reason it is important to keep these cases under observation and have the growth removed before permanent damage is done to the circulatory system. It should be remembered that 90 per cent of the malignant tumors of the thyroid are carcinomas, and these take their origin from preexisting adenoma.

COLLOID GOITER. This series included only ten cases of colloid goiter, as this condition is usually met with only in the goiter belts, but is frequently endemic in these localities. It generally makes its appearance in females between 18 and 25 years of age, but is occasionally seen in males. The patient usually seeks medical advice for a diffuse enlargement of the thyroid gland, and does so for cosmetic reasons. These belong to the phlegmatic type of individuals.

There is a soft diffuse enlargement of the thyroid gland, involving both lobes and the isthmus. The consistency is much softer than that of an adenoma. There is no evidence of pulsation or bruit. There is no exophthalmos, and the pulse is normal. There are two conditions that are sometimes difficult to differentiate from a colloid goiter. (1) Sometimes an early Graves' disease may be confused with a colloid goiter with a psychoneurosis, but if a basal metabolism test is made, these two conditions can be easily distinguished as the metabolic rate is always elevated in the former and never in the latter. (2) Diffuse adenomatous goiter is occasionally difficult to differentiate from a colloid goiter and at times the differential diagnosis is not possible. On careful palpation discrete adenomata can occasionally be observed, having a firmer consistency than the other portions of the thyroid gland. If the colloid material predominates with a small adenoma, it is impossible to make the differential diagnosis until after the administration of iodine or thyroid extract.

Pathology. This condition involves the acini of the thyroid gland and on gross section the thyroid is soft and the acini are large and filled with colloid substance. Microscopically, the acini are very large and contain deeply stained colloid material. The cells of the acini are flat and the nuclei small, indicat-

ing a diminished secretory activity. This picture differs from that of an adenoma, which involves the fetal adenoma found in the interstitial tissue (Goetch).

Laboratory Data. The basal metabolism is of importance for its negative findings in this condition.

Prognosis. These cases, if seen early, will respond to iodine therapy, but if neglected, medical treatment is of questionable value.

TREATMENT. *Adenoma with normal secretory activity.* It is essential that a differential diagnosis should be made between an adenoma with normal secretory activity and an adenoma with hyperthyroidism, by a basal metabolism determination before treatment is undertaken. Medical treatment cannot arrest the process in the thyroid gland. The condition is one of a fetal adenoma which formed in the thyroid during intrauterine life, due, presumably, to an iodine deficiency in the mother at that time. After the adenoma begins to enlarge, there is a definite encapsulated tumor, which can be compared to an adenoma of the breast or uterus which will not respond to any form of medical treatment. Iodine or thyroid extract should never be given in this condition. The condition cannot be improved, and a non-toxic adenoma is very liable to be transformed into an adenoma with hyperthyroidism. All foci of infection should be corrected, as they are quite frequently a factor in producing acute strumitis. These cases should have an annual basal metabolism determination, since this is the only reliable method of detecting a beginning hyperthyroidism. If these cases are not showing local pressure symptoms, or do not demand removal for cosmetic reasons, surgery should not be resorted to until after thirty years of age, as the thyroid tissue is essential to development and vital functions. After thirty years of age, surgery should be definitely advised, since 90 per cent of the malignant tumors of the thyroid gland are carcinomas which arise from the preexisting adenoma, and the patient is safe-guarded against a hyperthyroidism of later years. *X*-rays and radium have not proven satisfactory in the treatment of adenomata.

Adenoma with increased secretory activity. This is a surgical condition, and the sooner a partial thyroidectomy is resorted to, the better the prognosis for the patient. In a recent article from the Mayo Clinic, a mortality was reported of 0.15% in 666 simple adenomata, and 3.48% in 201 cases of adenoma with hyperthyroidism. The difference in mortality was due to marked myocardial and nephritic changes which had taken place in the cases with hyperthyroidism. Ligation of the superior or inferior thyroid arteries is contraindicated, as one is dealing with an encapsulated tumor that has taken on increased activity.

Colloid goiter. The treatment of this condition is a medical problem, and the sooner the diagnosis is made and iodine administration begun, the better the prognosis. In neglected cases and in those past 25 years of age, there is very little chance of arresting the process with iodine. It is very important that all foci of infection should be eliminated when first seen. Iodine, preferably in the form of sodium iodide, 5 grains, t.i.d., offers the best results in these cases. In the neglected cases, thyroid extract, 1 to 3 grains, t.i.d., gives better results. Thyroxin, 1/60 grain, may also be employed if results are not obtained with the former treatment. Surgery should never be advised in any of these cases unless the patient is suffering from pressure symptoms, or demands removal for cosmetic reasons. If surgery is employed, iodine administration should be begun at once; otherwise the goiter is very likely to recur.

CONCLUSIONS

(1) This series of cases showed a lack of understanding of the clinical and pathological pictures of adenomata and colloid goiter by the family physicians.

(2) Adenoma cases should not have iodine or thyroid extract administered in any form.

(3) Colloid goiter is benefited by iodine only in the early stages.

(4) Carcinomata arise from preexisting adenomata and constitute 90% of the malignant tumors of the thyroid.

BLOOD TRANSFUSION*

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Pope Innocent VIII in 1492 is said to have been transfused in an effort, however unsuccessful, to prolong his life, the lives of three donors, so the unsubstantiated story goes, being sacrificed in the attempt.[1]

No convincing records of transfusion are available before William Harvey's presentation of his views of the circulation before the College of Physicians in 1616, and the published accounts of his work in 1628.

Mention is made of transfusion by an Italian physician Francesco Folli[2] in 1654, and by Daniel of Leipsig in 1664.

Richard Lower of Cornwall was the first to perform direct transfusion[3] using dogs, a cannula connecting the artery of one animal to the vein of the other. Samuel Pepys records in his famous diary on November 14, 1666—"at a meeting of Gresham College—the experiment of transfusing the blood of one dog into another was made before the society by Mr. King and Mr. Thomas Coxe upon a little mas-

*Read before the Chattanooga Academy of Medicine and Hamilton County Medical Society, June 13, 1924, and the Chattanooga District Medical Society, Dalton, Ga., June 18, 1924.

tiff and a spaniel, with very good success." Another entry on November 21, 1667: "poor and debauched man that the College had hired for twenty shillings to have some of the blood of a sheep let into his body —their purpose to let in about twelve ounces, which they compute is what will be let in in a minute's time by the watch"[4]. This was probably the first transfusion in man done in England.

The credit for the first human transfusion goes to Jean Denys of Paris, who on June 15, 1667, transfused a man with lamb's blood[5]. The procedure then became so popular and was so highly unsuccessful that it was banned by the French Government until the Faculté de Paris should give its approval.

Blundell[6] in 1817 reported 7 transfusions with human blood for postpartum hemorrhage, with three recoveries. Dieffenbach[7] in 1828 wrote extensively on the subject. Dumas and Prevost[8] in 1821 first noticed the injurious effect of injecting the blood of one species into another. Bischoff[9] in 1835 introduced defibrination. Panum[10] insisted that defibrination was necessary for a successful transfusion. Blasius[11] in 1863 reported 116 transfusions, 56 of which were successful. During the Franco-Prussian War there were 37 transfusions reported. Its popularity rose to dizzy heights and the claims of its champions were preposterous, literally as a panacea for all evils.

Landois[12] in 1875 discovered that animal serum would hemolyze human blood; this discovery stopped animal-to-man transfusion. Subsequently the discoveries of Maragliano in 1892, Landsteiner in 1900, and Eisenberg in 1901 that sera of diseased or even normal donors will hemolyze alien blood, have revolutionized the whole subject of transfusion.

Landsteiner[13] in 1900 demonstrated that the blood of humans and some animals can be classified into three groups. Jansky[14] in 1907 added the fourth group. The work of these two is the foundation underlying the modern development of blood transfusion. Ottenberg[15] in 1908 recorded the first transfusion in which tests for blood compatibility were made.

In 1898 Crile of Cleveland began a series of experiments that marked the introduction of transfusion as a safe and valuable therapeutic procedure. First using the arteriovenus suture after the work of Payr[16], later the ring-cannula method as first suggested by Nitze in 1897. The technic of vascular anastomosis became so perfected through the work of Carrel[17] of the Rockefeller Institute, that this method, in the hands of those experienced in blood vessel surgery, came into vogue. However, so difficult was this method that there were soon many modifications. Crile's cannula was modified by Janeway, Elsberg, Soresi, Bernheim, and Levin. Then followed the glass cylinder of Kimpton and Brown in 1913, and the modifications of Vincent and Percy. In the same year appeared the syringe-cannula method of Lindeman, first used by Ziemssen twenty years previously.

After this came the almost simultaneous work of Lewisohn[18] and Weil[19] in this country, of Agote[20] in Buenos Ayres, and of Jeanbrau[21] of Montpelier on the use of sodium citrate as an anticoagulant. The brilliant results of human blood transfusion during the past few years, and the ease with which this operation can be performed by any one of a number of methods has made it one of the most common procedures in practical medicine and surgery.

In a concise statement of the indications for blood transfusion, which are already well known, I am unable to improve upon the tabulation of Ravdin and Glenn[22], from whose work I have drawn liberally in the paragraphs above.

I. Loss of Blood: To this group belong all those cases of anemia from acute hemorrhage, as well as those cases due to small long-continued blood losses. Some of the latter, however, finally fall into the second group.

II. Diseased Blood: Transfusion for this group serves the following functions,

1. To stimulate hematopoietic function.
2. To increase coagulability.
3. To add to the oxygen-carrying capacity.
4. To increase the bactericidal or antitoxic properties of the blood.
5. To increase the general nutrition.

III. Shock.

The amount of blood to be transfused depends, of course, on the indication, the dosage being "enough", yet governed by the receiving capacity of the patient. In my own series of transfusions, done largely because of loss of blood, prior to or, less frequently, subsequent to surgical procedure, the quantity is usually 500 cc., repeated as often and as many times as is thought necessary. This amount (500 cc.) given slowly and with meticulous caution does not unduly burden the cardiac musculature. The therapeutic benefit to be expected from this quantity depends upon the accuracy of the compatibility tests, the condition of the patient, and the virtue of the donor's blood, the latter varying greatly. 500 cc. drawn from an average size person, 132 lbs., assuming that the total blood volume is 8% of the body weight, is about 10% of the total blood volume. Bayless[23] has shown by clinical and experimental data that if the blood volume is kept up, the red blood cells can be cut in half in rather acute hemorrhage without serious results. According to Ashby[24] the life of the transfused erythrocyte in its new host is 30 days or more.

In accepting donors for transfusion there are three laboratory prerequisites; a negative Wassermann

reaction, a red cell count well above 4,000,000, with a normal differential count and, most essential of all, the compatibility tests, either crossed agglutination and hemolysis tests of the donor and recipient or grouping, or both. In an emergency, with an apparently healthy donor, the first two may be omitted, or the Wassermann test may be omitted for economic reasons if the donor and recipient are living in connubial bliss, but never the matching of the bloods.

According to Kimpton[25], Cherry and Langrock[26], de Biasi[27], and Falls[28], children under two years of age either belong to no group or their group characteristics are not sufficiently developed, and they are willing to use the mothers as donors without matching the bloods. Happ and Zeiler[29] and Astrowe[30] differ with these findings.

The mutual direct blood matching is generally preferred to the indirect grouping, and can be done with only slightly greater technical difficulties. It is more specific in that the donor is matched directly against the recipient; in this method agglutination due to the subgroups within the four principle groups of Jansky or Moss is brought out[31], [32], [33]. That a recipient may change his group after a transfusion was first observed by Libman and Ottenberg[34], this finding makes it imperative to match the bloods of the donor and recipient just before each transfusion, and not to rely on the grouping done weeks or months before. Pseudo-agglutination or nummulation may be prevented by diluting the test serum with physiologic saline solution[35]; it is not a specific phenomenon, but is related to and subject to the same influences as the sedimentation rate of erythrocytes, which recently has received much attention in continental literature.

There is a distinct racial distribution of isohemagglutinins, so that each race of man has its characteristic "race index."[36] [37]. This hemagglutinating property is contained in the pseudoglobulin fraction of the blood, the euglobulin and albumin apparently playing no part[38]. The hereditary factor, the transmission of the "dominant" and "recessive" agglutinins, follows the Mendelian Law.[39]

The blood group may be temporarily changed or influenced by diet[40] and by some drugs and anesthesia.[41] [42] Other observers find no change in the blood group after long anesthesia.[43]

Some posttransfusion reactions may be explained by the fact that the serum of group 4 of Moss or group 1 of Jansky may vary not only in agglutinative power in different persons, but also in the same person at different times.[44] Guthrie and Pessel[31] have demonstrated four different types in group 4, hence the use of this group as a universal donor is to be condemned, unless cross matching is done.

Methods used are many, in fact the choice of a method is the strategic point around which there is being waged such a battle of words. The direct method of vascular anastomosis, the theoretically ideal, has been largely discarded because its virtues do not justify its difficult technic in the hands of the average physician. Of the indirect method there are two schools, those favoring unmodified blood, and those favoring citrated blood.

Compared with the preliminary testing of donor and recipient the method used—whether syringe, stopcock, paraffinized glass cylinders, jointed cannula, shuttle valve, or sodium citrate—is of minor importance. "The percentage of posttransfusion chills is about the same, no matter what method is used."[45] Ravdin and Glenn[22] had as many reactions from the Kimpton-Brown paraffinized glass cylinder method as from the citrate method. Meleney and associates[46] found no difference in the frequency of chills in comparing the Lindeman syrings method with the citrate method. Brines[47] prefers the Unger stopcock but advises against the complete abandonment of the citrate. Lederer[48], Pauchet[49], Horsley[50], Unger[51], and Bernheim[52], prefer whole blood methods.

Unger says, "for blood disease, where blood is required as a tissue * * * * there can be no question as to the superiority of whole unmodified blood. In cases of hemorrhage, on the other hand, when the purpose is not so much to replace pathologic with normal blood, but rather to replenish the impoverished circulation or to bring about cessation of hemorrhage, citrated blood may serve as a substitute."[53] He finds that sodium citrate diminishes the available quantity of complement in two ways, by its direct action on complement itself, and by the addition of an anticomplementary substance which inactivates complement; and further that sodium citrate reduces almost to nil the function of opsonins and phagocytosis. Drinker and Brittingham[54] claim that reactions are due to platelet changes incident to early coagulation and that sodium citrate increases erythrocytic fragility with a hemolytic tendency.

Unger's conclusions concerning the diminished opsonic index due to sodium citrate are evidently wrong, because in the Wright method of ascertaining the opsonic index the white blood cells are collected in a solution of sodium citrate (1.5%-2%) which is ten times stronger than the percentage employed in a citrate transfusion.[45] The other two points claimed by Unger have been disproven by Mellon, Hastings, and Casey[55] who found no anticomplementary power in citrated plasma and no deleterious effect on either the white or the red blood cells, differing thus also in the increased fragility findings of Drinker and Brittingham.

Love finds that sodium citrate in the amount used in blood transfusion has no pharmacologic effect on the circulation contraindicating its use.[56] Busman[57]

says that substances from the rubber tubing may be a factor in reactions.

Henderson and Haggard[58] find experimentally that sodium citrate in exsanguinated dogs is almost immediately fatal. Joannides and Cameron[59] repeated the work of Henderson and Haggard with very different results. They find that a dog is not affected by an amount of sodium citrate comparable, by body weight, to a human transfusion of 2,500 cc. and its contained citrate, which is rather a large dose. They conclude that the objections to citrated blood transfusions in exsanguinated human beings, based on experimental work, are unwarranted.

Various investigators have called attention to the variable hydrogen-ion concentration or chemical reaction of sodium citrate as a cause of transfusion reactions.[60] When fluids with higher or lower hydrogen-ion concentration than the blood are injected in rate or amount greater than the blood can buffer or neutralize, reactions characterized by chills and prostration follow. Distilled water, even when kept well stoppered, becomes highly acid, and solutions made with this water will be acid. Buffering intravenous solutions will prevent such reactions.[61] If the p-H factor is of importance it is not the chemical neutralization of the sodium citrate, but more probably is the disturbance of colloidal equilibrium which may accompany the rapid neutralization of solutions with an abnormal p-H value.

Giffin and Haines,[62] in a review of the professional donors at the Mayo Clinic say that, "reactions with the citrate method are extremely rare with posthemorrhagic and postoperative transfusions."

Of course, skill and technic differ to some extent with different transfusionists; this has been the apology and explanation of the champions of the various methods for reactions and failures. In arriving at a just conclusion as to the choice of method, we are fortunate in having the records of the Mount Sinai Hospital of New York City for 1922. It was as this hospital that both the citrate method of Lewisohn and the stopcock method of Unger—the simplest and most popular method for whole blood transfusion—were brought out. Both of these methods are used in the hospital and the transfusions are done by both the attending and resident staffs, who may be considered average transfusionists. Their records for the year 1922 show that chills followed transfusion by the whole blood method in 34% of the cases, while 23% had chills after citrate transfusions.[45]

In conclusion, I find from a review of the literature and from personal experience with various methods, that the citrate method of blood transfusion is the method of choice, especially in surgical conditions requiring transfusion.

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SURGERY OF THE LABIAL FRENUM

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There are two labial frena, the superior and inferior. We are most concerned with the frenum labii superioris, since the lower labial frenum is rarely the seat of any abnormality. When it is, however, the same principles involved in the surgery of the superior frenum apply to it as well.

Only a very limited discussion of the anatomy of the labial frena is found in any of the text-books. Such a well known work as Gray's dismisses the subject with the mere designation of them as folds of mucous membrane connecting the lips to the jaws. The fullest description of these structures that I have been able to find is by Cryer, in his section on region-

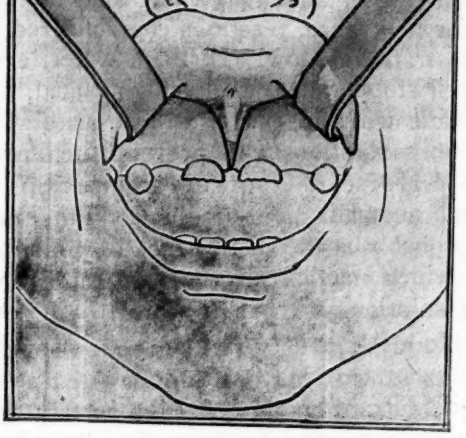

Fig. 1. Drawing showing elongation of the frenum labii superioris, causing separation of central incisors in mouth of child.

al anatomy, in the American System of Dentistry. He considers only the superior frenum and says that it is made up of fibers of both depressor labii superioris muscles, plus mucous membrane. The following is his description of these muscles:

"The depressor labii superioris is a small muscle arising from the lower portion of the incisive fossa of the superior maxilla and the alveolar process immediately below the fossa. Its fibers pass upward to the lower border of the nostrils and the partition of the nose. A portion of the fibers of this muscle is attached to the integument covering the wing of the nose: the balance pass downward and are inosculated with the fibers of the muscle of the upper lip. It, with its fellow and the mucous membrane, forms the frenum of the upper lip, and when the alveolar process is absorbed after the loss of the teeth, it is often found attached to the lower margin of the gums."

From this description it would seem as though the frenum (in mentioning frenum I shall hereafter consider only the superior) has some function in the depressing action of the lip. From clinical

observation this does not seem to be the case. The frenum can be incised or excised without any noticeable results in the action of the lip. Therefore, functionally, it is an excess structure.

However, abnormalities of the frenum interfere considerably with the development and regularity of the teeth, and in later adult life, they hamper successful prosthesis by the dentist. The normal frenum is attached to the gums between and about one quarter of an inch above the central incisors. In abnormal cases it extends down between these teeth and is attached to the palatal mucosa behind them. This condition in children prevents the approximation of the central incisors and consequently causes irregularity of the dental arch. In later life where

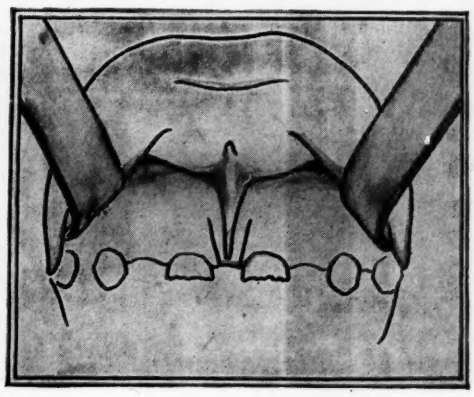

Fig. 2. Positions of incisions.

the central incisors have been lost, the extension of the frenum upon the ridge of the jaw is one of the most potent factors in dislodging an artificial denture.

By a simple operation this annoying malformation can be obviated. Local anesthesia is used. About five minims of a 2% novocain-suprarenin solution is infiltrated into the frenum proper. In ten minutes the anesthesia is profound.

OPERATION

After determining the amount of tissue we wish to have remain we make two vertical incisions, one on either side of the frenum (figure 2). The incisions converge and meet at a point slightly behind the insertion of the frenum. In operating, when the incisors are in place, care must be taken not to run the incisions into the free margin of the gum, for fear of injuring the peridental membrane, and paving the way for a peridental infection. With a fine, sharp periosteal elevator, the tissue between the incisions is raised and dissected clear of the process. We now have a triangular flap with the apex toward the insertion of the frenum, and the base toward the muco-labial fold. With scissors the pendulous tissue is removed (figure 3). The remaining gap of process is carefully dried, and coated over with a solution made of iodoform 1 oz. and collodion 7 oz. In twenty-four hours epithelization takes place, and within five days the denuded process is covered with new tissue. It is surprising how quickly this wound heals. No after-treatment is necessary except the use of a suitable mouth-wash. Physiological salt solution answers this purpose splendidly.

In the case of children where the incisors have been separated by the abnormal elongation of the frenum, the teeth can be brought together by an orthodontic appliance. Two gold bands are fitted over the incisors and connected with a jack-screw and nut. The bands are then cemented on the teeth, and the nut turned a little every week until the teeth are gradually brought together. The appliance is then removed, the screw and nut are cut off, and

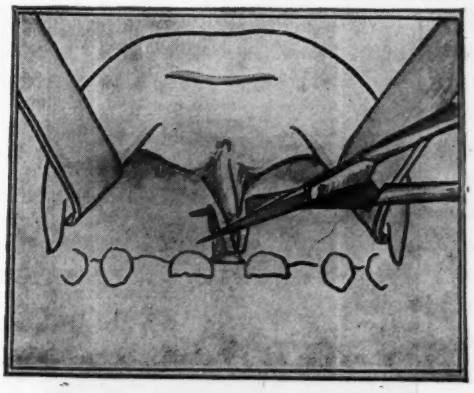

Fig. 3. Portion of frenum dissected from process and being severed at base.

the bands are soldered together. They are once more cemented on the teeth and left there for six months as a retaining appliance. If any other regulation of the dental arch is needed it is done accordingly.

CONCLUSIONS

1. The frenum labii superioris is evidently made up of fibers from the depressor labii superioris muscles and mucous membrane.
2. Functionally it is unimportant.
3. By its abnormal elongation it prevents the proper approximation of the central incisors, and causes irregularity of the dental arch.
4. In later adult life, after the loss of the central incisor teeth, it frequently causes serious interference with the retention of artificial dentures.
5. The operation for abnormal elongation of the frenum is done under local anesthesia and consists in removing a triangular piece of tissue the base of which limits the amount to be removed.
6. In children the separated incisors can be brought into position by means of orthopedic appliances.

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Acute appendicitis in infancy and childhood owes its peculiarity to the insidiousness of onset and its tendency to rapid perforation.—HENRY F. HELMHOLZ in *Minnesota Medicine*.

FRACTURE OF THE ANTERIOR SUPERIOR SPINE OF THE ILIUM BY MUSCULAR VIOLENCE. A CASE REPORT*

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It appears that epiphyses that originate during early adolescence are most subject to separation or fracture, such as the tibial tubercle, the lesser femoral trochanter and the anterior superior spine of the ilium. During this stage of life, children are most active, especially males, and these epiphyses are situated at points most subject to strain. I have met with fractures or avulsions of the tibial tubercle and

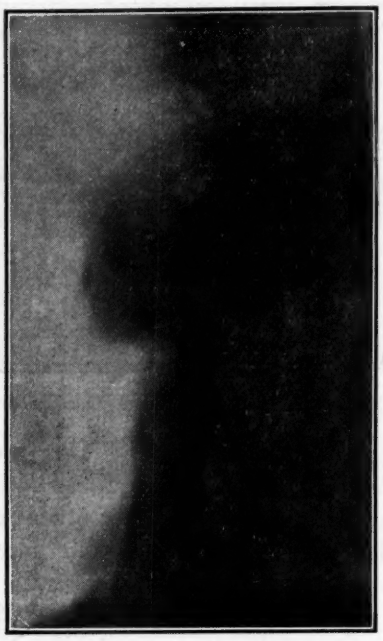

Fig. 1. Showing fracture of the anterior superior spine of the ilium in an oblique view.

lesser trochanter of the femur, and I wish to report here an instance of fracture of the anterior spine of the ilium that has recently come under my observation at the Clinic of the Hospital for the Ruptured and Crippled:

S. K., school boy, aged 15, weight 110 lbs., height 5 feet, 2 inches; came to the hospital May 8, 1924, complaining of pain in the right groin. On May 1st, while running a 100-yard dash, he was seized with a sudden sharp pain in the right groin after traversing one-half the distance. This occurred as he raised his thigh and hyperextended his trunk. He stopped running and walked off the field unassisted, suffering excruciating pain; this was somewhat alleviated by having the "leg pulled," as he expressed it. He walked home, a distance of about half a mile, and remained there for one week. He sat about during this time, with the limb resting on a chair, or limped about the house with the aid of a cane. Home remedies were applied with some relief.

Examination: White boy, not athletic in type; walks about without assistance with a slight right hip limp and without deviation of the body. Presents two ecchymotic areas about the right hip, both anterior and posterior to the anterior superior spine. There is no restriction of motion, although extension and abduction are painful, more especially when he is turned on the unaffected side. There is a thickening of the parts of the anterior third of the ilium and immediately distal to it, a small mass, bony in character, about the size of a quarter dollar, tender, adherent to the underlying parts. There is no crepitation or fluctuation. Poupart's ligament is not disturbed, although its ilial attachment is tender. No atrophy or shortening. Abdomen negative.

Diagnosis: Fracture of the anterior superior spine, confirmed by roentgen ray.

Treatment: A low pelvic and hip strapping was applied for two weeks, at the end of which time the patient reported to the clinic, stating that he was entirely well and could run short distances without discomfort.

The anterior superior spine of the ilium appears at puberty together with the following centers: one for the posterior superior spine; one for the ventral two-thirds of the iliac crest; one for the anterior, inferior iliac spine; a scale-like epiphysis over the tuberosity

Fig. 2. Antero-posterior view.

of the ischium; a separate epiphysis for the spine of the ischium. Fusion between these and the primary centers is usually complete between the twenty-second and twenty-fifth years. (Cunningham, Text-Book of Anatomy).

As to the mechanism; most authors agree that the fracture occurs as a result of hyperextension of the trunk on the thigh. The tensor fasciae femoris muscle being the strongest of those attached to the spine, it is probably the one most active in producing the fracture. To bear this out, I wish to cite the following instance:

A man of 25 appeared at the clinic complaining of pain in the left flank and left hip, stating that about one week previously he slipped down three steps. In an attempt to save himself he suddenly hyperextended his body and was immediately seized with pain across the hip and flank of the left side. We found that, in addition to a fracture of the transverse processes of the second, third and fourth lumbar vertebrae on the left side, there was a separation of the muscular fibers of the tensor fasciae femoris muscle from its insertion into the fascia lata of the thigh, none of the other muscles attached to the spine being disturbed. If this patient were younger, the anterior superior spine would unquestionably have been torn loose. As the man was seen on but one occasion, no further report can be given.

The first of the above cases is the twenty-second reported instance of fracture of the anterior superior spine of the ilium by muscular violence. The literature covering the previous twenty-one instances is recorded by Louis Carp in the *Annals of Surgery*, April, 1924.

1215 MADISON AVENUE.

*From the service of Dr. Royal Whitman at the Hospital for Ruptured and Crippled.

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New York City

ELMIRA, NEW YORK, OCTOBER, 1924

CHRONIC DUODENAL STASIS

Chronic stasis and dilatation of the duodenum involving the third portion, and produced at or by the passage over the gut of the superior mesenteric vessels, is a real anatomical condition, the symptoms produced from which some surgeons have in recent years undertaken to relieve. To be sure, the condition is one that is mostly found in visceroptotics who are—or who are usually accused of being—neurotic; and there are those physicians who object to operation for this condition and would class such a procedure with the many other hitching, tacking and "kink"-dividing operations that have been employed in enteroptosis, of which some have been abandoned and some are obsolescent.

This conservative attitude is commendable so far as it applies to comparatively mild cases. Probably they can be managed well enough by selective diet, postural treatment, corsets, etc. We are not quite prepared to accept the dictum of no operation for all cases, however, for some of them suffer from persistent vomiting and progressive loss of flesh that appear to be traceable to the duodenal obstruction. In such cases unmistakable dilatation of the duodenum, sometimes extreme, is easily demonstrable at operation. Various authors have noted that it is not apt to be seen on the roentgenographic plate (and the condition is not easily differentiated, clinically, from duodenal ulcer, gastric and gall-bladder affections). We have some reason to believe, however, that the stasis, dilatation and reverse peristalsis can be observed *fluoroscopically*. J. R. Verbrycke, of Washington, (*Southern Medical Journal,* September, 1924) also regards fluoroscopy as more valuable than films in the *x*-ray diagnosis of this condition.

E. L. Kellogg, of New York, has made the most extensive observations of the condition. (*Annals of Surgery,* 1921, 73, 518). He reported duodeno-jejunostomy (Bloodgood) in 41 cases of duodenal obstruction, of which 36 were completely relieved, 4 were markedly improved, and 1 unimproved. In the *Atlantic Medical Journal,* April, 1924, J. P. Griffith of Pittsburgh reported 6 cases, of which 5 were greatly benefitted and 1 improved but little by duodeno-jejunostomy. In the same month James McKenty of Winnipeg recorded in *Surgery, Gynecology and Obstetrics* an experience of 26 cases, in 13 of which he performed duodeno-jejunostomy: 1 died of obstruction (angulation), 1 is recorded as slightly improved, 9 are described as well, and 2 as much improved. He advises, however, the safer operation of suspension of the cecum, ascending colon and hepatic flexure (to relieve the mesenteric drag), restricting duodeno-jejunostomy "to the more extreme cases of dilatation and to those in which the cause of the mesenteric compression cannot be discovered and removed." This suspension operation he performed in 13 of his 26 cases and has found it satisfactory. Kellogg also refers to this among the operations that may be considered for duodenal obstruction. Frost Buchtel of Denver regards "megalo-duodenum" as a cause of chronic indigestion insufficiently stressed. He operated upon nine cases: five by some form of plastic operation and four—with extreme dilatation—by duodeno-jejunostomy. These four he reported in *Colorado Medicine,* September, 1924. Three, males, were enteroptotic; the fourth, a female, was not. All appear to have been cured. In the year following Kellogg's first paper Hugh Crouse, of El Paso, published an anatomico-clinical study of chronic duodenal dilatation (*Archives of Surgery,* November, 1920) in which he stated that duodenal dilatation is a frequently occurring condition, that it is curable surgically, and that the duodenum (supra- and retrocolonic) and the duodeno-jejunal fold should be examined in exploratory operations and operations upon gall-bladder, stomach and colon. He recommended plication of the gastro-hepatic omentum (Bayes) and similar procedures, as indicated, but for cases of marked duodenal dilatation he advised duodeno-jejunostomy. His experience was of 49 cases of which, 5 were treated surgically.

So far as our own quite limited experience goes, when the duodenum is definitely dilated duodeno-jejunostomy presents no difficulty and the result is

gratifying. It must be remembered, however, that except Kellogg's earlier cases, reported in 1918, and a few scattered cases, recorded observations of duodeno-jejunostomy for chronic duodenal stasis have been limited to the past three years. Therefore it is still too early, and the operators have been too few, to give the procedure its place. It may become established as the operation of choice for duodenal stasis; it may be abandoned for other modes of treatment. It seems neither fair to condemn it, nor wise to enthusiastically accept it, until more general experience has accumulated.

Progress in Surgery

Selections from Recent Literature

The Motor Significance of Hemangioma. With the Report of a Case of Plexiform Telangiectasis of the Sciatic Nerve and Its Branches. S. F. STEWART and MONA E. BETTIN, Los Angeles, Calif. *Surgery, Gynecology and Obstetrics*, September, 1924.

Angioma of the most trivial sort should be regarded much more seriously than at present. All angiomata should be regarded as potentially malignant by extension. In an obscure condition the presence of superficial nevi in either the same metamere or on other parts of the body would be suggestive of an angiomatous cause. A hitherto painless tumor of the soft parts of the body wall or extremities which suddenly becomes painful, should suggest an angioma invading the peripheral nerves as one of the possibilities. Destruction of an angioma by some rational method should be undertaken as a prophylactic measure, as soon as recognized.

Consideration of Periarterial Sympathectomy. (*Considerations sur la Sympathectomie Periarterielle*). JEAN JIANO, Bucharest. *Revue de Chirurgie*, No. 7, 1924.

The author's main indications for the operation of Lériche are: 1. Dry gangrene. 2. As an adjuvant to antiluetic treatment in destructive syphilitic lesions. The author's technique does not differ in the main from that described by Lériche. He has practiced this operation in cases of endarteritis obliterans, leutic arteritis with dry gangrene, ulceration due to freezing and ulcerations due to varicose veins, in the ulceration of bad amputation stumps and in perforating ulcers due to various trophic disturbances, to tabes, hemiplegia and lesions of the sciatic nerve. Thirty cases are reported with a large proportion of satisfactory results.

Appendicitis Chronica Larvata as Part of a Large Disease Complex. (*Appendicitis chronica larvata als Teil eines grossen Krankheitskomplexes.*) ARTHUR MUELLER, Munich. *Archiv. für Klinische Chirurgie*, August, 1924.

The author is of the opinion that too much importance has been laid on individual organ disease to the exclusion of the just appreciation of disease in relation to the organism as a whole. He considers that so-called chronic appendicitis is a condition that should be evaluated in the light of its effects on the whole human mechanism. The appendix is diseased in a very high percentage of cases: Aschoff claims in 75% of all cases examined, while Oberndorfer states that in 600 cases examined there were very few exceptions. The appendix is apparently first involved in some form of colitis. Frequently recurring, often insignificant attacks lead to a round cell infiltration in the muscular wall of the appendix. This evidence of inflammation is seldom to be recognized macroscopically but it leads to scarring and stenosis of the appendix. If the appendicular lumen be not occluded the exudate resulting from slight inflammatory processes is vacuated into the cecum without any untoward consequences. If, however, this drainage be interfered with the usual sequellæ of appendicular inflammation may supervene. As a result of the persistence of small foci of infection in the wall of the appendix with the resulting absorption of toxic products there may occur the various signs of general intoxication, such as headache, dizziness and the various neuralgias. The organs of the female pelvis are particularly liable to secondary involvement. The author advises that in all chronic diseases of the abdomen the possible presence of a chronically diseased appendix be borne in mind.

Gentian Violet Solution Intravenously in the Treatment of Phlebitis. WILLIAM F. SHALLENBERGER, Atlanta, Ga. *Surgery, Gynecology and Obstetrics*, September, 1924.

This is a preliminary report on the intravenous injection of gentian violet solution in the treatment of phlebitis. Although used in only 5 cases so far, the results have been striking. Shallenberger uses a 0.5% solution and has given larger amounts. The solution is prepared by dissolving gentian violet in sterile freshly distilled water and then filtered; sterilization of the solution is not necessary. The author has not noted any bad symptoms or reactions, but some of the patients have manifested nervousness and complained of weakness. Sweating was frequently observed. A bluish tinge to the skin simulating cyanosis usually appears, but passes off in a short time. The treatment can be repeated several times at 2- or 3-day intervals.

The Adequate Surgical Treatment of Gastric and Duodenal Ulcers. (*Zur Frage der Zweckmaeszigsten Behandlung des Magen- Duodenalgeschwürs.*) HANS FINSTERER, Vienna. *Wiener Klinische Wochenschrift*, July 17, 1924.

On the basis of over 300 extensive gastric resections Finsterer reiterates his contention of six years ago to the effect that the only adequate treatment of gastric and duodenal ulcers consists in the removal of not less than 1/2 to 2/3 of the stomach. Mere resection of the antrum is not sufficient, in the author's opinion, to prevent the development of subsequent trouble. The histologic work of Storck and Konjetzny have proven that all cases of duodenal ulcer show a marked concomitant gastritis, which may be looked upon as the etiologic moment in the development of jejunal ulcers subsequent to the Billroth II operation. To avoid this sequela the author advises the wide gastric resection. Finsterer observes that the resulting "small" stomach need not be viewed with any fear. In practically none of his cases were the much feared achylia and the consequent gastrogenic diarrhea noticed, while almost all showed such a marked improvement as to indicate the necessity of extensive resection.

Undescended Testicle. Operative Treatment and End-Results. CHARLES G. MIXTER, Boston. *Surgery, Gynecology and Obstetrics*, September, 1924.

Operations for undescended testicle in childhood may be expected to yield 75 to 80% of satisfactory results, that is to say, the testicle remains in the scrotum and subsequent atrophy does not ensue. To attain this result, the spermatic circulation should be preserved and the cord lengthened sufficiently to allow the testicle to be placed in the scrotum without tension. In a certain number of cases, in particular those of the intraabdominal variety, it will be necessary to section the spermatic vessels. Where this procedure is unavoidable, atrophy occurs in 85% of the testes. It is indicated in only about 10% of all cases.

Atrophy may ensue where the spermatic vessels are not divided. This is probably due to accidental tearing of some of the trunks at operation or inclusion in the stitches, if the cord is anchored to Poupart's ligament.

Operation may be undertaken at any age with the expectation of a good result, if the accompanying hernia becomes troublesome or other indications arise. The preferable age for operation is between 5 and 12 years. At an earlier age the structures are so delicate that injury

to the spermatic vessels is difficult to avoid.

Orchidectomy should not be done in childhood. Replacement of the testes in the abdomen should also be avoided on account of the risk of a future malignancy. In even the most difficult case, section of the spermatic vessels and transposition of the vas and its accompanying vessels behind the deep epigastric will make it possible to place the testis in the scrotum. The examination of the cases that have been operated upon in childhood with preservation of the spermatic circulation and have passed the age of puberty, frequently reveal on palpation a testicle that has apparently developed normally.

From this series no light has been thrown on the spermatogenetic function of the undescended testis subsequent to an operation performed before puberty.

Use of Tutocaine in Urology. (*Anwendung des Tutocains in der urologischen Praxis.*) V. BLUM and A. GLINGAR, Vienna. *Wiener Klinische Wochenschrift,* August 14, 1924.

The authors have for some time past been using tutocaine in preference to novocaine or the other usual local anesthetics in their urologic practice. This anesthetic gives adequate analgesia without any of the drawbacks of the other anesthetics. In work about the bladder, the prostate or the kidney a 1/4% to 1/5% solution is used without the addition of adrenalin.

For all intravesical operations the bladder is filled with 150 cc. of a 1% solution. For anesthetizing the urethra a 2-4% solution has proven most satisfactory.

Our Present Attitude Toward Fibroid Tumors. WILLIAM NEIL, JR., Baltimore. *American Journal of Obstetrics and Gynecology,* August, 1924.

Neil summarizes as follows:

1. There is too much operating done on fibroid tumors on insufficient indications.

2. The average fibroid does not need operation, but occasional observation; this applies to those up to about the size of a five months' pregnancy.

3. The possible "complications" have too often been used as a bugbear to stampede patients into operation on the ground of what might take place if the tumor is let alone, or again on the supposition of presumptive complications to be discovered at operation.

4. This whole standpoint is not rational, as the serious complications can be discovered by careful physical examination.

5. Cases where there is any grave doubt as to diagnosis or complications should be included in the operative class.

6. Many cases where "fibroids with complications" have been found and an operation done have been incorrectly billeted. The proper label would be a small fibroid incidental to the other trouble.

7. Fibroids with serious complications, demonstrated or suspected, call for radical operative treatment. Where the fibroid is uncomplicated, if treatment is called for, then radium must be given the first consideration and operation the second.

The Contraindication to Radium in the Treatment of Diseases of the Female Pelvis. F. E. KEENE, Philadelphia. *American Journal of Obstetrics and Gynecology,* August, 1924.

Keene regards the following conditions as contraindicating radium treatment of myomata and "myopathic hemorrhage":

1. *Tumors larger than a three months' pregnancy.* Such tumors often present more or less extensive benign degenerative changes which are not favorably influenced by radium and are not uncommonly associated with adnexal or intestinal disease.

2. *Rapidly growing tumors* suggesting sarcoma or actively progressing benign changes within the tumor, such as hemorrhage, necrosis or liquefaction.

3. *Uncomplicated tumors of any size giving rise to symptoms other than abnormal menstruation.* The symptoms requiring treatment are, to a great extent, mechanical in origin, the result of traction or pressure, hence their relief is dependent upon removal of the tumor. While disappearance of the tumor is a common occurrence following irradiation, the process is a slow one and excision is the better procedure.

4. *Tumors associated with pelvic pain.* Pain in association with a myoma is not uncommonly due to adnexal disease, especially a chronic inflammation, to degenerations within the tumor or to an adenomyoma.

5. *Pedunculated tumors, whether subperitoneal or intrauterine.*

6. *Tumors producing hemorrhage and complicated by demonstrable adnexal disease.*

7. *The presence of a marked secondary anemia in association with tumors not giving rise to sufficient uterine bleeding to account for the anemia.*

8. *Tumors in young women.* Radium in sufficient dosage to cause disappearance of the tumor will very likely produce a premature menopause and sterility.

9. *Tumors so distorting the uterine cavity that introduction of radium well above the internal os is impossible.*

10. *In cases where differentiation between a myoma and an adnexal tumor cannot be definitely determined.*

11. *Myomata or myopathic hemorrhage in nervous women.* When full doses of radium have been used, (1200 milligram hours) menopausal symptoms develop in about 65%. Of these, 35% exhibit very marked symptoms.

12. *In cases of radiophobia.*

End Results of 201 Cases of Carcinoma of the Cervix. HOWARD C. TAYLOR and THOMAS C. PEIGHTAL, New York. *American Journal of Obstetrics and Gynecology,* September, 1924.

1. *Advanced Cases.*—This group, when treated by radium alone shows much better results than were formerly obtained by any other nonoperative palliative procedure, or by such operative measures as the use of the actual or Percy cautery. The growth locally in the cervix and vaginal walls can be controlled, so that the patient is infinitely more comfortable than formerly: and the parametrial involvement can for a long period be held in abeyance,—especially if radiation is combined with external x-radiation. Treatment with radium in such cases is a safe procedure: for in none of the 81 cases radiated in the past seven years, has death resulted from its use.

2. *Early Cases.*—This group, when subjected to hysterectomy, shows 34% free from growth three years or more after operation; 25% free five years or more; and where hysterectomy was accompanied by radiation 44% had no recurrence three years or more, and 31% five years or more after the removal. These rsults compare very favorably with the figures reported by those clinics where radium is available in large amounts, and radiation alone is the adopted method of treatment. Thus, where radium can be used in limited amounts only,—such as 100 milligrams of the element,—and the method of application must necessarily be limited also, hysterectomy plus radiation is still the method of choice in early cases.

Osteosis Cutis. W. WILLIAM BECKER, Rochester, Minn. *Archives of Dermatology and Syphilology,* August, 1924.

A case is reported of a hard, resilient plaque, containing osseous tissue, in the scalp of a woman aged 32. The duration of the lesion was fourteen years, during which time mechanical irritation had caused repeated ulceration and crusting, and bodies "like bone" had been removed. There was no history of previous trauma. The overlying skin was cicatricial with follicular atrophy, there being about half the normal amount of hair on the area. Microscopic study revealed islands of true bone, having lamellar configuration, a periosteum or pseudo-periosteum, marrow cavities with endosteum, and lacunae and canaliculae. No other calcified tissue and no cartilage were seen. "Osteosis cutis" is preferred to "osteoma cutis," as there is single or multiple infiltration of the connective tissue with bone, rather than a distinct tumor formation. The occurrence of concomitant hypertrichosis, a kerotitic nevus of the sole and a nevus pigmentosus of the finger, suggests that the osteosis may have been a nevus formation, due to fetal inclusion or a

phylogenetic atavism.

Diagnosis of osteosis cutis is difficult as the lesions may be confused with calcified plaques. Prognosis is excellent, and the treatment is surgical. Excision should include any adjacent pathologic tissue.

Direct Leverage in the Reduction of Certain Fractures. JAMES E. M. THOMPSON, Lincoln, Neb. *Surgery, Gynecology and Obstetrics,* September, 1924.

This procedure should not be followed except after a reasonable effort at manual manipulation has failed. The technic can be more simply carried out under the fluoroscope; however, it is just as applicable if an incision is used large enough to admit the forefinger into the wound, so that with the aid of the finger as a guide to the lever the apposition of the fragments can be assured. When this work is done under the fluoroscope there is a minimum amount of trauma and also the least possibility of infection, but in fractures of the femur and leg bones, where fixed traction must be maintained on a fracture table the fluoroscope is not practical.

In a fracture of the forearm in the middle third, for example, the type of lever used is an ordinary dental probe with a rounded end. For heavier levers use one-fourth inch round steel 8 to 12 inches long, with a blunted point. A small stab wound is made with a scalpel over the fractured fragments at the most convenient position for the application of the leverage. The point of the lever is inserted in this small wound. An assistant makes traction on the extremity. Lights are dimmed and, guided by the use of the fluoroscopic screen, pass the lever between the ends of the fragments in the same plane with the overriding and displacement, the end of the lever being inserted to the medullary portion of the under fragment. Then the lever is brought through an arc toward the upper fragment, making pressure forward and downward against the upper, and backward and upward against the under fragment. The operator's free hand aids in perfecting the alignment and apposition. Sterile dressings are placed about the lever and saturated with alcohol. Sterile sheet wadding bandages are applied to the extremity and the plaster-of-Paris cast over this, anchoring the lever in the position which maintains apposition of the fractured fragments. When the cast is hard the end of the lever can be sawed off so that the patient will not bump the lever and cause displacement of the fragments. After a week or 10 days a small opening in the cast around the lever is cut and the lever pulled out. By this time callus has begun to form and approximation is relatively assured. When both bones are overriding, two levers may be used and both of them be embodied in the cast.

The Transolecranon Approach. (*La Voie Transolecranienne*). P. GUILLOT, Antwerp. *Archives Franco-Belges de Chirurgie,* No. 5, 1924.

Guillot advises his method in all severe injuries of the elbow to secure adequate reposition of fractured fragments and thus avoid the serious ankyloses, nerve compressions and ischemic contractures that frequently follow the closed method of treatment. The author makes a semicircular incision convex downward between the condyles of the humerus. This incision may be extended downward to secure better exposure of the parts. The method consists essentially in a temporary osteotomy of the olecranon process. The olecranon with its attached muscle is reflected upward and the necessary procedures for the reposition and maintenance of the displaced fragments carried out. At the conclusion of the operation the olecranon is fixed in position by a nail and the arm placed in a desired degree of flexion. Three cases of extensive trauma to the elbow are reported with extremely satisfactory results.

Contribution to the Study of the Bloodless Treatment of Dupuytren and Bimalleolar Fractures. (*Contribution à l'étude du traitment non-sanglant des fractures bi-malléolaires et de Dupuytren.*) G. FERRY, Strassburg. *Revue de Chirurgie,* No. 6, 1924.

The author observes that open reduction of these types of fractures while indicated in certain cases may in the great percentage of cases be dispensed with provided care is taken to reduce the deformity under anesthesia. The deformity once reduced must be maintained in extreme adduction. Particular attention must be taken to obtain the adduction at the subastragaloid joint and not at the mediotarsal joint, i. e., the foot as a whole must be placed in extreme varus. The reduction is controlled by *x*-ray examination, preferably the fluoroscope. A molded posterior splint is sufficient to maintain the reduction.

Bad Amputation Stumps of the Extremities. (*Les mauvais moignons d'amputation des membres.*) F. DUGUET, Val de-Grace. *Revue de Chirurgie,* No. 7, 1924.

Duguet was led to a review of the subject by the consideration of the results of war amputations. Approximately 40% of the lower limb amputations and 9.5% of the upper extremity had to be reoperated. In the main, infection, a poor operative technic and the exigencies of operation in the field are to be held responsible for the poor results. Poor amputation stumps may be due to lesions of the skin, muscles, nerves, or bone. Vicious or adherent cicatrices are to be treated by excisions. Ulcerations of the skin are to be treated by hydrotherapy and heat and light baths. Conical stumps, due to muscular retractions or excessive bone growth must be subjected to reamputation. Painful stumps due to infection of the nerve, painful neuroma, or the inclusion of the nerve in scar tissue may be treated by several methods, among them alcohol injection, high resection of the nerve, reamputation, radicotomy, or in select or stubborn cases by the periarterial sympathectomy of Lériche. The great majority of improper amputation stumps have an infection of the bone. These bone infections and their treatment, according to the accepted principles of the treatment of osteomyelitis are considered at length.

Book Reviews

Hernies. Par MAURICE PATEL, Professeur Agrégé a La Faculté de Médecine de Lyon Chirurgien des Hôpiteaux de Lyon. Octavo; 150 pages; 172 figures. Paris: J. B. BAILLIERE ET FILS, 1924.

Patel's monograph on hernia constitutes one of a series issued as the "Nouveau Traité de Chirurgie" under the editorship of Delbert and Schartz. The work is divided into three main parts. The first part is devoted to a consideration of hernia in general. The indications for the various medical and surgical procedures are broadly outlined and a fairly comprehensive discussion of the etiology and pathology of hernia is given. The second and third parts of the volume are devoted to a very inclusive consideration of herniae according to their site and their content. Traumatic and retroperitoneal hernia and the various eventrations, post-operative or otherwise, are not discussed. The different operative procedures are critically discussed in a very satisfactory manner.

Diabetes. Its Treatment by Insulin and Diet. A Handbook for the Patient. By ORLANDO H. PETTY, B.S., A.M., M.D., F.A.C.P., Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania; Physician in Charge of Department of Metabolism, Philadelphia General Hospital; Physician in Charge of Department of Diabetes, Memorial Hospital; Visiting Physician to Memorial Hospital, Philadelphia, Pa. Duodecimo; 111 pages; illustrated. Philadelphia: F. A. DAVIS COMPANY, 1924.

It is important that the diabetic patient should himself understand the selection, measurement and preparation of his foods, the examination of his urine, and the rationale, operation and administration of insulin. Such information, in simple form, is contained in this small handbook.